

IN THE CLAIMS:

Claim 1 (previously presented) An isolated strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine) and deposited under Accession Nos. P97121504, P97121505 and P97121506 with the European Collection of Cell Culture on 15<sup>th</sup> December 1997.

Claim 2 (previously presented) An isolated nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus of subtype *adw*, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus of subtype *adw* in that the amino acid at position number 145 of such polypeptide is an arginine rather than a glycine.

Claim 3 (previously presented) The isolated nucleic acid of claim 2, wherein the polypeptide is being encoded by nucleotides 155 through 835 of the nucleic acid sequence designated SEQ. I.D. No. 1.

Claim 4 (previously presented) The isolated nucleic acid of claim 3, comprising nucleotides "AGA" in positions 587-589.

Claim 5 (previously presented) The isolated nucleic acid of claim 2, wherein the nucleic acid is DNA.

Claim 6 (previously presented) The isolated nucleic acid of claim 2, wherein the

nucleic acid is RNA.

Claim 7 (previously presented) The isolated nucleic acid of claim 5, wherein the nucleic acid is cDNA.

Claim 8 (previously presented) The isolated nucleic acid of claim 5, wherein the nucleic acid is genomic DNA.

Claim 9 (previously presented) The isolated nucleic acid of claim 2, wherein the polypeptide has an amino acid sequence that is the same as amino acid residues 174 through 400 of the amino acid sequence designated SEQ. I.D. No. 3.

Claim 10 (previously presented) An isolated nucleic acid which encodes a peptide, wherein the peptide is encoded by a nucleic acid molecule comprising nucleotides 527 through 595 of SEQ. I.D. No. 1.

Claim 11 (previously presented) An isolated nucleic acid which encodes a peptide, wherein the peptide has an amino acid sequence comprising amino acid residues 298 through 320 of the amino acid sequence designated SEQ. I.D. No. 3.

Claim 12 (previously presented) A vector comprising an isolated nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus in that

the amino acid at position number 145 of such polypeptide is an arginine rather than a glycine and operatively linked to a promoter of RNA transcription.

Claim 13 (previously presented) A vector comprising an isolated nucleic acid encoding a peptide, wherein the peptide is encoded by a nucleic acid molecule comprising nucleotides 527 through 595 of SEQ. I.D. No. 1.

Claim 14 (previously presented) The vector of claim 12, wherein the vector comprises viral DNA.

Claim 15 (withdrawn) A host vector system for the production of a polypeptide which comprises the vector of claim 12 in a suitable host.

Claim 16 (withdrawn) A host vector system for the production of a peptide which comprises the vector of claim 13 in a suitable host.

Claim 17 (withdrawn) A method of producing a polypeptide which comprises growing the host vector system of claim 15 under suitable conditions permitting production of the polypeptide and recovering the polypeptide so produced.

Claim 18 (withdrawn) A method of producing a peptide which comprises growing the host vector system of claim 16 under suitable conditions permitting production of the polypeptide and recovering the polypeptide so produced.

Claim 19 (withdrawn) A method of obtaining a polypeptide in purified form which

comprises:

- (a) introducing the vector of claim 12 into a suitable host cell;
- (b) culturing the resulting host cell so as to produce the polypeptide;
- (c) recovering the polypeptide produced into step (b); and
- (d) purifying the polypeptide so recovered.

Claim 20 (withdrawn) A method of obtaining a peptide in purified form which comprises:

- (a) introducing the vector of claim 13 into a suitable host cell;
- (b) culturing the resulting host cell so as to produce the polypeptide;
- (c) recovering the polypeptide produced into step (b); and
- (d) purifying the polypeptide so recovered.

Claim 21 (withdrawn) A purified polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus deposited under Accession Nos. P97121504, P97121505 and P97121506 with the European Collection of Cell Culture on 15<sup>th</sup> December 1997, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine rather than a glycine.

Claim 22 (withdrawn) A purified polypeptide obtained from a method which

comprises:

- (a) introducing a vector comprising an isolated nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus deposited under Accession Nos. P97121504, P97121505 and P97121506 with the European Collection of Cell Culture on 15<sup>th</sup> December 1997, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine rather than a glycine and operatively linked to a promoter of RNA transcription into a suitable host cell;
- (b) culturing the resulting host cell so as to produce the polypeptide;
- (c) recovering the polypeptide produced in step (b); and
- (d) purifying the polypeptide so recovered.

Claim 23 (withdrawn) A purified peptide, wherein the peptide has an amino acid sequence comprising amino acid residues 298 through 320 of the amino acid sequence designated SEQ. I.D. No. 3.

Claim 24 (withdrawn) A purified peptide obtained from a method which comprises:

- (a) introducing a vector comprising an isolated nucleic acid encoding a peptide which comprises at least a portion of a

mutant major surface antigen of a strain of hepatitis B virus deposited under Accession Nos. P97121504, P97121505 and P97121506 with the European Collection of Cell Culture on 15<sup>th</sup> December 1997 wherein the peptide is encoded by a nucleic acid molecule comprising nucleotides 527 through 595 of SEQ. I.D. No. 1 into a suitable host cell;

- (b) culturing the resulting host cell so as to produce the polypeptide;
- (c) recovering the polypeptide produced in step (b); and
- (d) purifying the polypeptide so recovered.

Claim 25 (previously presented) An oligonucleotide of at least 15 nucleotides capable of specifically hybridizing with a sequence of nucleotides within a nucleic acid which encodes a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine rather than a glycine, without hybridizing to any sequence of nucleotides within a nucleic acid which encodes the major surface antigen of a wild type hepatitis B virus.

Claim 26 (previously presented) The oligonucleotide of claim 25 comprising nucleotides that are complementary to nucleotides 527 through 595 of SEQ. I.D. No. 1.

Claim 27 (withdrawn) A method of obtaining antibodies to a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, and not to the major surface antigen of a wild type hepatitis B virus, comprising:

- (a) obtaining the polypeptide in a purified form;
- (b) immunizing an organism capable of producing antibodies against the purified polypeptide;
- (c) collecting the produced antibodies;
- (d) combining the produced antibodies and the purified polypeptide under conditions to form a complex; and
- (e) determining which produced antibodies form a complex with the purified polypeptide so as to obtain antibodies to the polypeptide.

Claim 28 (withdrawn) The method of claim 27, wherein the polypeptide is being encoded by nucleotides 155 through 835 of the nucleic acid sequence designated SEQ. I.D. No. 1.

Claim 29 (withdrawn) The method of claim 27, wherein the polypeptide has an amino acid sequence substantially the same as amino acid residues 174 through 400 of the amino acid sequence designated SEQ. I.D. No. 3.

Claim 30 (withdrawn) The method of claim 27, wherein the organism comprises a rabbit or a mouse.

Claim 31 (withdrawn) A method of obtaining antibodies to a peptide, wherein the peptide has an amino acid sequence comprising amino acid residues 298 through 320 of the amino acid sequence designated SEQ. I.D. No. 3, comprising:

- (a) obtaining the peptide in a purified form;
- (b) immunizing an organism capable of producing antibodies against the purified peptide;
- (c) collecting the produced antibodies;
- (d) combining the produced antibodies and the purified peptide under conditions to form a complex; and
- (e) determining which produced antibodies form a complex with the purified peptide so as to obtain antibodies to the peptide.

Claim 32 (withdrawn) The method of claim 31, wherein the organism comprises a rabbit or a mouse.

Claim 33 (withdrawn) The antibodies obtained in claim 27.

Claim 34 (withdrawn) Monoclonal antibodies of the antibodies of claim 33.

Claim 35 (withdrawn) Antibodies capable of detecting a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having



an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, and incapable of detecting the major surface antigen of a wild type hepatitis B virus.

Claim 36 (withdrawn) Antibodies capable of detecting a peptide, wherein the peptide has an amino acid sequence comprising amino acid residues 298 through 320 of the amino acid sequence designated SEQ. I.D. No. 3.

Claim 37 (withdrawn) A method for use of a nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus subtype adw, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine for determining whether a subject is infected with a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine), wherein such method comprises

- (a) obtaining an appropriate nucleic acid sample from the subject;  
and
- (b) determining whether the nucleic acid sample from step (a) is, or is derived from, a nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a

wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine.

Claim 38 (withdrawn) A method for use of a nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine for determining whether a subject is infected with a strain of Hepatitis B virus designated Human Hepatitis B virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine), wherein such method comprises

- (a) obtaining an appropriate nucleic acid sample from the subject;
- and
- (b) determining whether the nucleic acid sample from step (a) is, or is derived from, a nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, wherein the nucleic acid sample in step (a) comprises mRNA corresponding to the transcript of DNA encoding a polypeptide which is a mutant major surface antigen of a strain

of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, and wherein the determining of step (b) comprises:

- (i) contacting the mRNA with the oligonucleotide of claim 25 under conditions permitting binding of the mRNA to the oligonucleotide so as to form a complex;
- (ii) isolating the complex so formed; and
- (iii) identifying the mRNA in the isolated complex so as to thereby determine whether the mRNA is, or is derived from, a nucleic acid which encodes the polypeptide.

Claim 39 (withdrawn) The method of claim 37, wherein the nucleic acid sample in step

- (a) comprises mRNA corresponding to the transcript of DNA encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, and wherein the determining of step (b) comprises:

- (i) translating the mRNA under suitable conditions to obtain an amino acid sequence; and
- (ii) comparing the amino acid sequence of step (i) with the amino acid sequence encoded by the isolated nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine rather than a glycine, wherein the polypeptide has an amino acid sequence substantially the same as amino acid residues 174 through 400 of the amino acid sequence designated SEQ. I.D. No. 3 so as to determine whether the nucleic acid sample is, or is derived from, a nucleic acid which encodes the polypeptide.

Claim 40 (withdrawn) The method of claim 37, wherein the determining of step (b) comprises:

- (i) amplifying the nucleic acid present in the sample of step (a); and
- (ii) detecting the presence of polypeptide in the resulting amplified nucleic acid.

Claim 41 (withdrawn) A method of use of antibodies capable of detecting a polypeptide which is a mutant major surface antigen of a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine) for determining whether a subject is infected with a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine) wherein such method comprises:

- (a) obtaining an appropriate sample from the subject; and
- (b) determining whether the sample from step (a) is, or is derived from, a nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, by contacting the sample under appropriate conditions to bind to the antibodies of claim 35 so as to determine whether a subject is infected.

Claim 42 (withdrawn) The method of claim 37, wherein the isolated nucleic acid, oligonucleotide, or antibody is labeled with a detectable marker.

Claim 43 (withdrawn) The method of claim 42, wherein the detectable marker is a radioactive isotope, a fluorophor, or an enzyme.

Claim 44 (withdrawn) The method of claim 37, wherein the sample comprises blood, tissue, or sera.

Claim 45 (withdrawn) A method for identifying a chemical compound which is capable of treating infection by a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine), which comprises:

- (a) contacting a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, with the chemical compound under conditions permitting binding between the polypeptide and the chemical compound;
- (b) detecting specific binding of the chemical compound to the polypeptide; and
- (c) determining whether the chemical compound binds to the polypeptide so as to identify a chemical compound which is capable of treating infection by the viral strain.

Claim 46 (withdrawn) A method for identifying a chemical compound which is capable of preventing infection by a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine),

which comprises:

- (a) contacting a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, with the chemical compound under conditions permitting binding between the polypeptide and the chemical compound;
- (b) detecting specific binding of the chemical compound to the polypeptide; and
- (c) determining whether the chemical compound binds to the polypeptide so as to identify a chemical compound which is capable of preventing infection by the viral strain.

Claim 47 (withdrawn) A composition comprising a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, or derivative thereof, the amounts of such polypeptide being effective to stimulate or enhance antibody production in a subject, and a pharmaceutically acceptable carrier.

Claim 48 (withdrawn) A composition comprising a peptide, wherein the peptide has

an amino acid sequence comprising amino acid residues 298 through 320 of the amino acid sequence designated SEQ. I.D. No. 3. or derivative thereof, the amounts of such peptide being effective to stimulate or enhance antibody production in a subject, and a pharmaceutically acceptable carrier.

Claim 49 (withdrawn) A composition comprising the chemical compound identified by the method of claim 45 in an amount effective to treat infection by a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine) and a pharmaceutically effective carrier.

Claim 50 (withdrawn) A composition comprising the chemical compound identified by the method of claim 46 in an amount effective to prevent infection by a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine) and a pharmaceutically effective carrier.

Claim 51 (withdrawn) A method comprising administering the composition of claim 47 for treating a subject infected with a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine).

Claim 52 (withdrawn) A method comprising administering the composition of claim 49 for treating a subject infected with a strain of hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine).

Claim 53 (withdrawn) A method comprising administering the composition of claim



47 for preventing infection with a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine) in a subject.

Claim 54 (withdrawn) A method comprising administering the composition of claim 50 for preventing infection with a strain of Hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine) in a subject.

Claim 55 (withdrawn) A method of screening bodily fluids from a subject for a strain of hepatitis B virus designated Human Hepatitis B Virus Surface Antigen-'S'-145 Singapore Strain (Glycine to Arginine), which comprises:

- (a) obtaining an appropriate sample of bodily fluid from the subject;
- (b) determining the presence of a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, in the sample of step (a) so as to screen the sample for the strain.

Claim 56 (withdrawn) The method of claim 55, wherein the bodily fluid comprises blood, sera, or a nucleic acid sample of blood or sera.

Claim 57 (withdrawn) A method for use of an antibody that recognizes a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus for determining whether a subject has a predisposition for hepatocellular carcinoma, wherein said method comprises:

- (a) obtaining an appropriate nucleic acid sample from the subject;  
and
- (b) determining whether the nucleic acid sample from step (a) is, or is derived from, a nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, by contacting the sample under appropriate conditions to bind to the antibodies of claim 35 so as to determine whether the subject has a predisposition for hepatocellular carcinoma.

Claim 58 (withdrawn) The method of claim 57, wherein the nucleic acid sample in step (a) comprises mRNA encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, and wherein the determining of step (b) comprises:

- (i) contacting the mRNA with the oligonucleotide of at least 15 nucleotides capable of specifically hybridizing with a unique sequence of nucleotides within a nucleic acid which encodes a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine rather than a glycine, without hybridizing to any sequence of nucleotides within a nucleic acid which encodes the major surface antigen of a wildtype hepatitis B virus under conditions permitting binding of the mRNA to the oligonucleotide so as to form a complex;
- (ii) isolating the complex so formed; and
- (iii) identifying the mRNA in the isolated complex so as to thereby determine whether the mRNA is, or is derived from, a nucleic acid which encodes the polypeptide.

Claim 59 (withdrawn) The method of claim 57, wherein the nucleic acid sample in step (a) comprises mRNA encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a

wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, and wherein the determining of step (b) comprises:

- (i) translating the mRNA under suitable conditions to obtain an amino acid sequence; and
- (ii) comparing the amino acid sequence of step (i) with the amino acid sequence encoded by the isolated nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position 145 of such polypeptide is an arginine rather than a glycine, wherein the polypeptide has an amino acid sequence substantially the same as the amino acid residues 174 through 400 of the amino acid sequence designated SEQ. I.D. No. 3 so as to determine whether the nucleic acid sample is, or is derived from, a nucleic acid which encodes the polypeptide.

Claim 60 (withdrawn) The method of claim 57, wherein the determining of step (b) comprises:

- (i) amplifying the nucleic acid present in the sample of step (a); and

- (ii) detecting the presence of polypeptide in the resulting amplified nucleic acid.

Claim 61 (withdrawn) A method for use of an antibody that recognizes a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus for determining whether the subject has a predisposition for hepatocellular carcinoma, wherein said method comprises:

- (a) obtaining an appropriate sample from the subject; and
- (b) determining whether the sample from step (a) is, or is derived from, a nucleic acid encoding a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wildtype hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, by contacting the sample under appropriate conditions to bind to the antibodies of claim 36 so as to determine whether the subject has a predisposition for hepatocellular carcinoma.

Claim 62 (withdrawn) The method of claim 58, wherein the oligonucleotide or antibody is labeled with a detectable marker.

Claim 63 (withdrawn) The method of claim 62, wherein the detectable marker is a radioactive isotope, a fluorophor or an enzyme.

Claim 64 (withdrawn) The method of claim 57, wherein the sample comprises blood, tissue or sera.

Claim 65 (withdrawn) A method for identifying a chemical compound which is capable of treating hepatocellular carcinoma which comprises:

- (a) contacting a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of a major surface antigen of a wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, with the chemical compound under conditions permitting binding between the polypeptide and the chemical compound;
- (b) detecting specific binding of the chemical compound to the polypeptide; and
- (c) determining whether the chemical compound binds to the polypeptide so as to identify a chemical compound which is capable of treating hepatocellular carcinoma.

Claim 66 (withdrawn) A method for identifying a chemical compound which is capable of preventing hepatocellular carcinoma, which comprises:

- (a) contacting a polypeptide which is a mutant major surface antigen of a strain of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid

sequence of a major surface antigen of a wild type hepatitis B virus in that the amino acid at position number 145 of such polypeptide is an arginine, rather than a glycine, with the chemical compound under conditions permitting binding between the polypeptide and the chemical compound;

- (b) detecting specific binding of the chemical compound to the polypeptide; and
- (c) determining whether the chemical compound binds to the polypeptide so as to identify a chemical compound which is capable of preventing hepatocellular carcinoma.

Claim 67 (withdrawn) A composition comprising the chemical compound identified by the method of claim 65 in an amount effective to treat hepatocellular carcinoma and a pharmaceutically effective carrier.

Claim 68 (withdrawn) A composition comprising the chemical compound identified by the method of claim 66 in an amount effective to prevent hepatocellular carcinoma and a pharmaceutically effective carrier.

Claim 69 (withdrawn) A method comprising administering the composition of claim 47 as a medicament for treating hepatocellular carcinoma.

Claim 70 (withdrawn) A method comprising administering the composition of claim 67 as a medicament for treating hepatocellular carcinoma.

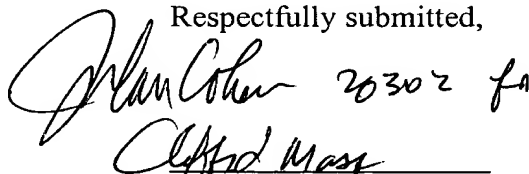
Claim 71 (withdrawn) A method comprising administering the composition of claim 47 as a medicament for preventing hepatocellular carcinoma.

Claim 72 (Previously Presented) A method comprising administering the composition of claim 67 as a medicament for preventing hepatocellular carcinoma.

Claim 73 (withdrawn) A hepatitis vaccine, comprising a mutant form of the surface antigen of hepatitis B virus, such polypeptide having an amino acid sequence which differs from the amino acid sequence of the major surface antigen of hepatitis B in that the amino acid at position number 145 of such polypeptide is an arginine rather than a glycine.

Claim 74 (withdrawn) The vaccine of claim 73, further comprising an adjuvant.

Respectfully submitted,

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